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CRAF: THE PERSIAN GULF WAR AND IMPLICATIONS FOR THE FUTURE

by

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Operations.

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The Civil Reserve Air Fleet (CRAF) program today provides almost one-half of the U.S. military's strategic airlift needs. Although CRAF's partial activation was successful in the Persian Gulf War, weaknesses in the program will reduce its effectiveness during a total mobilization. This examination of the CRAF performance in the Gulf War will identify issues, provide conclusions, and recommend solutions to improve the program. In addition, unique operational considerations are presented to improve the theater commander's awareness of CRAF limitations. As such, this study will focus on the operational considerations of CRAF relative to the war-fighting Commander-in-Chief. The case is argued that CRAF can not effectively fulfill its war time commitments under a full Stage II or Stage III activation. Problems experienced during the Gulf War in stage allocations, logistics, management, and equipment will be magnified in a larger activation and significantly reduce CRAF effectiveness when we'll need it the most. To insure the future effectiveness of CRAF, this paper recommends we reorganize the stage system, restructure CRAF logistics concept, emphasize contingency management of CRAF, and provide basic military equipment to the CRAF forces.

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The Civil Reserve Air Fleet (CRAF) program today provides almost one-half of the U.S. military's strategic airlift needs. Although CRAF's partial activation was successful in the Persian Gulf War, weaknesses in the program will reduce its effectiveness during a total mobilization. This examination of the CRAF performance in the Gulf War will identify issues, provide conclusions, and recommend solutions to improve the program. In addition, unique operational considerations are presented to improve the theater commander's awareness of CRAF limitations. As such, this study will focus on the operational considerations of CRAF relative to the war-fighting Commander-in-Chief. The case is argued that CRAF can not effectively fulfill its war time commitments under a full Stage II or Stage III activation. Problems experienced during the Gulf War in stage allocations, logistics, management, and equipment will be magnified in a larger activation and significantly reduce CRAF effectiveness when we'll need it the most. To insure the future effectiveness of CRAF, this paper recommends we reorganize the stage system, restructure CRAF logistics concept, emphasize contingency management of CRAF, and provide basic military equipment to the CRAF forces.

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CHAPTER I

INTRODUCTION

"Our focus now is on regional crisis and contingencies, a capacity for crisis response is sadly all too relevant in a global security environment that could be far more unstable than during the cold war."

Defense Secretary Dick Cheney[1]

As U.S. National Security Strategy shifts from forward defense to forward presence, U.S. power projection capability increasingly depends on strategic airlift and the Civil Reserve Air Fleet.[2] Today's national military strategy depends on CRAF for almost one-half of U.S. strategic airlift needs; however, operational issues and restrictions may limit CRAF's ability to fulfill its share of wartime mobility commitments.[3]

The use of CRAF in the Persian Gulf War was a success, however less than a quarter of the total force was used.[4] Consequently, operational difficulties experienced in this conflict may prove to be strategic vulnerabilities in a full CRAF mobilization. This paper will identify operational issues of CRAF that have strategic implications and recommend solutions for Transportation Command (TRANSCOM) and the theater commander for improving the use and efficiency of CRAF. This paper will also identify operational constraints peculiar to CRAF and will discuss their implications for the theater commander. This study focuses on current operational deficiencies as identified in the Gulf War, rather than on long-term force structure problems and concepts.

The next chapter will highlight the emerging role of strategic airlift in national security strategy to equip the reader with a sense of the important role CRAF plays.

Chapter III will outline the major structural aspects of CRAF, to provide a background for understanding the issues. Next, this paper will address the role of CRAF in the Gulf War and identify operational issues. Chapter V will present operational considerations for the theater commander derived from the Gulf War experience. Finally, the last chapter will present conclusions about the strategic readiness of CRAF and propose recommendations for operational improvement.

CHAPTER II

THE EMERGING ROLE OF STRATEGIC AIRLIFT

"Any time we have to take an action, we will have to move a force very, very quickly. From a strategy standpoint, I see transportation being of increased importance . . . our nation must be prepared with little warning to project significant US forces great distances to areas that may have little or no infrastructure."

General Hansford T. Johnson, Commander-in-Chief USTRANSCOM[1]

An understanding of the critical importance of strategic airlift to the defense of the United States will help the reader appreciate the essential role CRAF plays. As we approach the 21st Century, strategic airlift is emerging as a paramount component for execution of U.S. National Security Strategy. Since World War II, Soviet deterrence has been the focus of military strategy; however, the Soviet disintegration has shifted our focus to worldwide regional security, relying on strategic mobility. In fact, despite the current fiscal environment, funding for mobility assets is growing while virtually all other components of the military are being cut.[2]

The capability of strategic airlift to rapidly move forces to areas of potential conflict is increasingly crucial as forward basing and naval presence decline. The nay-sayers argue the collapse of the Soviet threat allows increased warning time and actually decreases our dependence on airlift. However, the lack of a specific threat, combined with fewer forward positioned land and sea forces only increases our dependence on power projection capability. In addition, lead time may not be usable as the premature movement of forces may appear belligerent. Recent events, such as Operations Just Cause and Desert Storm, highlight the increasingly

volatile international security environment and the need for a rapid airlift response to quickly stabilize the situation. During Desert Shield, this capability provided a swift military response helping to prevent an invasion of Saudi Arabia.

In 1981, the Congressionally Mandated Mobility Study analyzed U.S. strategic cargo airlift requirements in terms of "millions of ton miles per day" (MTM/D). Four separate worldwide scenarios, based on different threats, were addressed and the strategic airlift requirements varied from 73 to 125 MTM/D.[3] Due to fiscal restraints, a goal of 66 MTM/D was set, as the actual figures were unattainable. The conclusions of the Mobility Study emphasize *cargo* capability as the critical airlift shortfall. Consequently, passenger capability, as measured by "millions of passenger miles" per day (MPM/D), is not normally used to measure airlift capabilities and shortfalls.

Today, the combination of Military Airlift Command's (MAC), organic airlift capability and CRAF is only 48 MTM/D. In addition, Secretary Cheney recently abandoned the 66 MTM/D goal by decreasing the C-17 purchase from 210 to 120 airframes.[4] Acknowledging the Soviet collapse and changing mobility requirements, TRANSCOM just completed a Revised Intertheater Mobility Study.[5] The draft copy concludes airlift requirements have *not* decreased and our national airlift shortfall will continue into the foreseeable future.

In summary, the new U.S. regional focus on a broad based threat, combined with a smaller forward presence increases our dependence on strategic airlift. As seen in the Gulf War and other recent crisis, unexpected confrontations can occur any

time and any where. Therefore it is imperative our organic and CRAF airlift forces are ready to meet the challenges of today's unpredictable international security environment.

CHAPTER III

THE ROLE OF CRAF IN STRATEGIC AIRLIFT

NATIONAL AIRLIFT POLICY: "The national defense airlift objective is to ensure that military and civil airlift resources will be able to meet defense mobilization and deployment requirements in support of US defense and foreign policies. Military and commercial resources are *equally* important and interdependent in the fulfillment of this national objective."

NATIONAL SECURITY DECISION[1]
DIRECTIVE NUMBER 280

Hopefully the reader now has a better understanding of the increasingly vital role strategic airlift plays in U.S. National security. As such, to meet the requirements of our strategic mobility plans, CRAF is an important partner with the military. The CRAF can provide up to 515 aircraft and is designed to move 95% of the passengers (154.2 MPM/D) and over one-third (17.6 MTM/D) of the cargo in a full effort war scenario.[2] To support this large force, CRAF has evolved into a complex system consisting of three stages and five segments, as shown in Table 1.

TABLE 1
COMPOSITION OF CRAF PROGRAM
(# OF AIRCRAFT-AS OF OCTOBER 1991)

Segment	Stage I	Stage II	Stage III
Long-range international (PAX)	18	73	256
Long-range international (Cargo)	23	41	150
Short-range international	—	23	33
Domestic	—	35	35
Alaskan	—	8	8
Aeromedical	—	—	33
Total	**41**	**180**	**515**

Note: The higher stages of CRAF include all lower stage aircraft. Source: See Appendix I. CRAF Quarterly Summary, Scott AFB: HQ MAC/XOV, 1 October 1991 .

CRAF aircraft are placed into five segments based on capability: long-range international; short-range international; domestic; aeromedical; and Alaskan. The long-range international segment is further divided into cargo and passenger

capabilities, with a portion "convertible" to carry either cargo or passenger loads. The long-range international cargo segment provides the cargo (MTM/D) capability identified as the critical shortage in the Mobility Study. The Alaskan stage provides aircraft capable of operations in the Arctic environment.

CRAF is activated incrementally in three stages with each succeeding stage corresponding to an increasing airlift crisis and activated by a successively higher level of authority. In addition, a stage may be activated by segments only. For example, during the Stage II Desert Shield activation only the long-range international cargo segment was activated.

Stage 1 of CRAF is simply an airlift expansion stage providing 3 MTM/D of cargo and 13.2 MPM/D of passenger capacity within 24 hours to TRANSCOM.[3] The commander of TRANSCOM has authority to make a Stage I activation.[4]

Stage II is considered an airlift emergency and will provide only an additional 2 MTM/D of cargo and 33.8 MPM/D of passenger capability since the majority of additional aircraft are passenger.[5] The Secretary of Defense has authority to make a Stage II activation.

Stage III activation is considered in times of National Emergency and is also activated by the Secretary of Defense. This stage provides MAC with an additional 335 aircraft consisting of 12.5 MTM/D of cargo and 108 MPM/D of passenger capability.[6] Stage III is the first opportunity to activate aeromedical evacuation aircraft. In addition, the total number of Stage III aircraft is restricted by agreements with the Department of Transportation (DOT). DOT allocates commercial

aircraft to the military during wartime or national emergency to avoid dual commitments and to insure vital sectors of the economy remain functioning.[7]

In addition to providing aircraft, civil carriers are also contractually obligated to provide aircrews, parts, maintenance, and fuel.[8] To coordinate the civil logistics and support system in a Stage III scenario, MAC created a "senior lodger" concept. Under the senior lodger concept a single civil air carrier is designated to be the executive agent at various locations in the US and around the world. This carrier is expected to support aircraft as they transit their designated station. For example, Evergreen International Airlines is the designated host at Brussels National Airport, Belgium.[9] Appendix II is an extract from Military Airlift Command Regulation 55-8 delineating the services expected of the senior lodger.

The most critical aspect of the CRAF program is its voluntary participation. Consequently, TRANSCOM must provide incentives to civil carriers in return for their participation. The more aircraft a company commits to earlier stages, the higher priority it receives for peacetime military airlift contracts. In fact, this system is the basis for air transportation of over 95% of military passenger movement in peacetime, amounting to over $700 million a year making the military the airlines' largest single customer.[10]

By agreement with DOT, CRAF assets during a crisis are centrally managed under MAC "mission control", while the civil carriers retain "operational control" of the individual aircraft.[11] Mission control simply allows MAC to direct the cargo

load, point and destination, while the civil carriers direct all supporting requirements. During an airlift emergency, a MAC Crisis Action Team of airlift specialists is formed to manage CRAF aircraft through a secure communication interface with each civil carrier's operations center.

In addition to U.S. civil aircraft, MAC has agreements with NATO countries and South Korea for foreign airlift assistance in the event of contingencies in their respective theaters.[12] The NATO Allied Precommitted Civil Aircraft Program (NAPCAP) includes allied airlift to support a European contingency and South Korea promises aircraft only in a contingency involving their country. However, these aircraft are only available if the airlift requirement exceeds both U.S. organic and CRAF airlift capabilities.

In sum, due to the civilian and contingency nature of CRAF, its structure and use is complicated, however the relative small cost of this force is well worth the capability Conservative estimates value CRAF aircraft at $10 billion, which does not include air crews, operating costs, or infrastructure.[13] In contrast, alternatives to CRAF such as fast sealift, increased pre-positioning, and allied support; are very expensive and dependent on Congressional politics. In today's fiscal environment we simply can not afford to go to war without CRAF.

CHAPTER IV

CRAF AT WAR

"Airlift is what stabilizes a crisis, if we had relied on fast sealift, Saddam Hussein . . . could have been finished long before we got there. And the fact is our airlift is not adequate. People who say it is don't realize our forces arrived late. If we had been in a shooting war (in August), we couldn't have afforded that."

General Hansford T. Johnson, Commander-in-Chief USTRANSCOM[1]

The previous chapters traced the importance of strategic airlift in our national security strategy and how CRAF supports our strategic airlift needs. This chapter will look at the Gulf War and the CRAF performance under operational conditions. The CRAF performance was successful but there exists operational issues likely to hinder future CRAF mobilizations.

On August 17, 1990, Stage I of the CRAF was activated in support of Operation Desert Shield. The response was both positive and rapid as 16 different civilian carriers provided 17 passenger and 21 cargo aircraft to the military within 24 hours.[2] On January 16, 1991, Stage II of the CRAF was activated in anticipation of a massive and urgent sustainment for Desert Storm. This activation provided up to 181 additional aircraft to MAC, however only 79 international cargo aircraft were activated.[3] All told, during the deployment and the 43 day war, U.S. civil carriers provided 117 aircraft and ferried 397,300 or 80% of the total passengers and 95,000 tons of cargo or 17% of the total airlifted cargo.

Overall, CRAF made a tremendous contribution to the strategic mobilization effort, but the effort was not without problems. Additionally, we must recognize less than 30% of Stage II was activated; consequently, the following issues of

logistics support, aircraft stage allocation, CRAF management, and equipment deficiencies will be magnified under a full Stage II or Stage III CRAF mobilization.[4]

CRAF LOGISTICS

The senior lodger system, as mentioned, serves as the basis for CRAF management, maintenance, and logistical support only during Stage III activations. Therefore, during the Gulf War the senior lodger system was not used, revealing two major flaws in the senior lodger concept.

First, even if Stage III was activated, there was no designated senior lodger for the Arabian Peninsula -- the closest was in Egypt.[5] MAC does not have, nor ever expect to have, coverage under the senior lodger system.

Secondly, many of the logistics problems experienced by CRAF in the Gulf War could not be solved as the current senior lodger concept is designed. Quite simply, the job may be too big for a single carrier to accomplish. A Stage III activation would funnel over 400 aircraft through one or two stations supported by a carrier who's everyday fleet may not be 100 aircraft. Compounding this problem, is the extreme diversity among CRAF aircraft, consisting of 29 different aircraft types from seven different manufactures--a logistical nightmare.[6] Consequently, logistic problems experienced in the Gulf War are only harbingers of a full Stage III activation.

The civil aircraft diversity problem was seen in Desert Shield, as CRAF aircraft experienced a shortage of specialized ground handling equipment at both

departure and destination airbases.[7] Many times the result was enroute ground times triple the normal amount and reduced utilization rates. MAC did not have a plan to provide for this equipment, instead leaving these problems to the airlines who had no control and little notice as to where the flights were originating or going.

Another problem not easily solved by a civil carrier are services delegated to a senior lodger which can only be provided through diplomatic intervention. For example, customs and immigration clearance, as well as large volumes of jet fuel may only be provided if the particular country is supporting the war effort. The vast fuel supplies and good relations the U.S. enjoyed in the Persian Gulf and European staging locations was entirely out of the hands of a senior lodger, yet MAC continues to delegate these support functions.[8]

The senior lodger concept was recently addressed both by MAC and by a private study accomplished by the Logistics Management Institute.[9] In both studies, the proposal for improving logistics support is only a variation of the current senior lodger concept. The proposals still use a sole civil carrier to manage individual senior lodger locations and will extend the program to encompass all stages of CRAF. However, these proposals do not solve the coverage problem generated by the currently unpredictable international security situation. For example, there are absolutely no senior lodgers located in what used to be the Eastern Block countries. A system dependent on previous coordination of services without means to cover all regions is seriously faulted in today's environment.

CRAF STAGE SYSTEM

The operational basis of CRAF is the ability to meet increasing national airlift needs through the stage system. During Desert Shield, CRAF aircraft allocations between stages were inappropriate for the airlift requirements of the crisis, thereby causing cargo backlogs and inability to absorb passenger and cargo demand fluctuations.[10]

MAC quickly experienced an airlift cargo shortage during the Desert Shield mobilization. An analysis of CRAF aircraft reveals Stage I and II allocations favor passenger aircraft by a 60% to 40% margin, despite the known criticality of cargo airlift in all scenerios.[11] Consequently, Stage I was activated and the small number of cargo aircraft (21) was unable to overcome the cargo backlog. (See Appendix III for a graph of the cargo backlog.) At the same time, MAC actually experienced a surplus of CRAF passenger aircraft. This misallocation became even more apparent during Stage II, as MAC activated no passenger aircraft and all available cargo aircraft, yet the cargo backlog continued for the remainder of the crisis.

In addition to the cargo airlift shortage, MAC experienced severe fluctuations in passenger and cargo demands, which magnified the cargo backlogs. For example, during the 23 December to early January period, the cargo backlog was low, while the passenger demand peaked.[12] The best way to address this problem is to absorb cargo fluctuations with convertible aircraft, preferably civilian, to preserve the organic aircraft flexibility. Unfortunately, the Stage I and II allocations only contain 27 convertible aircraft, while in Stage III there are an additional 72. These

few convertible CRAF aircraft could not help absorb the sometimes weekly variations in passenger demands. (See Appendix III for graph of passenger fluctuations.) To compensate, MAC was forced to convert a number of versatile C-141 aircraft to passenger service, further contributing to the cargo backlog. The C-141 aircraft are capable of carrying a greater variety of cargo and land at a larger number of airports than CRAF counterparts. (See appendix IV.)

Another impact of stage misallocation was the absence of aeromedical evacuation aircraft in Stage I and II. Due to the absence of these aircraft, MAC was again forced to remove critical C-141 aircraft from the cargo airlift flow for aeromedical evacuation support.[13] TRANSCOM did not expect the high forecasted casualty rates experienced in the Gulf War for a Stage II activation scenario, therefore all 33 aircraft were unusable in Stage III.

A final concern about the current stage allocation is the lack of narrow body aircraft in the first two stages.[14] MAC traditionally favored large aircraft to maximize MTM/D and therefore placed smaller aircraft in Stage III. However, narrow body aircraft can operate into shorter fields and do not need sophisticated ground handling equipment. This capability increases the number of airfields the aircraft can transit, thereby increasing efficiency as transload cargo movements and airfield saturation decrease. The CRAF force currently has only 21 narrow body aircraft in Stages I and II and 87 in Stage III.[15]

An interesting negative side-effect of stage misallocation is the political aspects of activating CRAF stages, only to gain a relatively limited real increase in cargo

capability. Since the Stage I activation is less than a ten percent increase to overall organic capability, there exists a reluctance to use CRAF, and simply "make do" until military necessity forces a final hour decision. This delayed decision, in turn, effects the cumulative mobility effort.

During Desert Shield, the decision to activate Stage I was not made lightly, in fact, General Johnson activated Stage I only after consultation with the civilian carriers, the Secretary of the Air Force, the Chairman of the Joint Chiefs of Staff, the Secretary of Defense, and the Secretary of Transportation.[16] Additionally, during January, the activation of Stage III for cargo and aeromedical capability was considered but deemed politically infeasible.[17] Therefore, the Stage I and II aircraft increments need to be larger to coincide with the political magnitude of the decision.

All of these problems with stage allocation will have an overall negative cumulative effect on our strategic mobility capability. Granted, an instantaneous "National Emergency" Stage III activation would not experience these allocation problems, but the reality of politics and conflict escalation makes this possibility remote.

CRAF MANAGEMENT

Another problem producing inefficiencies, was the mission management task of integrating the relatively small CRAF force into the Desert Shield airlift flow. The airlift system, already working at capacity with over 300 C-5 and C-141 aircraft,

simply could not absorb CRAF capability overnight. Consequently, both the planning and execution capability of the strategic airlift system was exceeded. Additionally, the short notice received to integrate the civil air fleet caused severe scheduling problems for both military and civilian planners. Finally, very few allied aircraft provided strategic airlift, despite the large allied coalition.

On the military planning side, airlift planners, faced with diverse CRAF aircraft capabilities and limited CRAF training, could not reasonably incorporate the aircraft into the timed phased deployment system with only 24 hours of planning. The planners literally resorted to mission planning with pen and paper to develop an airlift flow.[18] The resultant under-utilization of civil aircraft was frustrating to commercial carriers as they lost money from idle aircraft, as well as market share on the busy commercial routes. One airline CEO claimed bitterly he could use the aircraft if MAC was not going to.[19]

Meanwhile, the civilian planners reacted to the short notice activation by literally cancelling flights and disrupted aircrew schedules to provide specific CRAF capable aircraft and crews.[20]

Finally, during execution, as the number of aircraft in the system increased, airbases quickly became saturated and caused a log jam in the airlift system. With some airports exceeding capacity by four times MAC was literally forced to stop the airlift flow for a day or two to clear up the system.[21]

One last concern regarding CRAF management was the failure to attract

substantial foreign assistance for strategic airlift.[22] Despite the existence of a large coalition including many NATO countries, there existed no agreements to integrate the airlift effort among the allies. Although, the foreign governments provided airlift for their own assets, there was almost no movement of U.S. assets by foreign carriers.

EQUIPMENT DEFICIENCIES

In addition to equipment shortages for logistics, CRAF carriers also experienced deficiencies in operational equipment during the Gulf War. The current CRAF system does not provide the minimum military equipment necessary to operate into a crisis area.

First, the airlines do not possess a military Identification, Friend or Foe (IFF) system to protect them from mistaken identity.[23] During Desert Storm, if air combat had expanded, safe passage could not have been possible for the civil aircraft.

Another equipment problem is the lack of chemical gear for airline crew members. There was no equipment dedicated to the CRAF aircrews; consequently, one airline actually purchased chemical gear for its crews off of the economy.[24] MAC eventually responded by pre-positioning equipment at high threat airports for general use. However, this was only a panacea as the CRAF aircrews were not properly trained, nor was equipment individually sized for effective use.

CHAPTER V

OPERATIONAL LIMITATIONS

Every major contingency plan includes the strategic airlift capability of CRAF, therefore the theater commander must understand CRAF forces are not coequal to military airlift capability. CRAF assets are civilian, crews are not trained and equipment not designed for use in austere environments or contingency conditions. Consequently, the following limitations must be considered by the theater commander when using CRAF assets.

First, civilian aircraft do not have the same operational flexibility as military aircraft. Ground handling equipment is different, maintenance is not readily available, cargo is restricted, and there are fewer available runways.

As previously noted, the diverse types of CRAF aircraft generate significant maintenance and ground equipment difficulties. The civil carriers are very proud of a TWA crew that actually hand-loaded a DC-10.[1] In addition, most CRAF aircraft can not carry vehicles or outsized cargo, thereby restricting them to non-combat ready palletized cargo.

Finally, Appendix IV shows the dramatic decrease in airfields available to CRAF aircraft. Most civil aircraft require 6,000 feet of runway length and 150 feet of width to land and takeoff. Consequently, civil carriers are forced to transit longer civilian runways, where they are severely restricted on the amount and type of hazardous cargo needed for a war effort.

The second operational limitation of CRAF aircraft is their greater vulnerability to possible enemy action and the subsequent political consequences. Not only

would a civilian aircraft loss portend the possible withdrawal of all CRAF aircraft, but also provide a significant political distraction. The cost of losing a civil aircraft and crew to hostile action may not be tolerable. Consequently, the theater commander must insure security concerns for civil aircraft and crews are higher than for military counterparts.

Next, the theater commander must be aware civilian aircrews are not trained to operate in a combat environment. They do not know how to use chemical gear and secure communications, nor are they familiar with electronic warfare effects in a hostile environment. For example, if Saddam Hussein had used chemical munitions, the continued use of CRAF aircraft in the Gulf area would have been doubtful.

Fourth, the theater commander does not have operational control of the CRAF forces; therefore, the ability to legally direct civilian crews does not exist. During the first critical weeks of Desert Shield, many military crews flew in excess of the 24 hour day crew day to get the job done, however, very few, if any civil carriers did. The CRAF aircrews were not at liberty to exceed the crew day, nor was the theater commander able to direct deviations.

Fifth, the physical capability of civilian pilots to operate safely in a protracted conflict is diminished as the average civilian crewmember is about twenty-five years older than his military counterpart. House Congressional testimony stated: "The biological and physiological differences between senior airline pilots who fly CRAF and pilots operating military transports is obvious. Civil flight crews . . .

subject to the same extreme levels of fatigue, and safety margins will be reduced to compromising levels."[2]

The next operational consideration for the theater commander is the possible lack of civilian aircrew discipline in a hostile environment. For example, during the Gulf War a 747 Captain departed Dhahran under a Iraqi Scud alert without flight clearance.[3] With the aircraft low on fuel he eventually landed at Riyadh airport, where five Scud missiles were shot down after he arrived. Not only was the civil crew and 200 troops in jeopardy from Scuds but he also flew, unauthorized, into airspace saturated with Air Force and Navy strike packages.

Finally, CRAF aircraft do not contain a military capable IFF system; therefore, US forces must have air superiority for CRAF forces to enter the area. During the Gulf War the U.S. forces achieved complete air superiority over an inept Iraqi Air Force, however we can not assume this favorable condition for future conflicts. Therefore, the theater commander must be prepared to accept CRAF losses or restrict CRAF aircraft and lose the associated cargo capability.

In conclusion, CRAF is a necessary and capable airlift asset as demonstrated in the Gulf War. However, the combination of numerous limitations and restrictions will guarantee a reduction in airlift capability even in the best conditions. General Johnson, Commander in Chief USTRANSCOM, commented: "The urgent need for airlift required the activation of CRAF . . . it was essential to our success".[4] Given the operational necessity of CRAF, the theater commander must understand the capabilities of CRAF are more vulnerable and less flexible than organic airlift.

Chapter VI

CONCLUSIONS AND RECOMMENDATIONS

"Deterrence is only credible if we possess a robust means of power projection and the mobility to deploy and sustain our forces"

General Colin Powell, Chairman of the JCS[1]

CRAF is essential to U.S. strategic airlift's capability to deploy and sustain forces in support of national security interests. We do not now, nor do we expect to, fulfill all contingency airlift needs, therefore it is imperative CRAF is capable of carrying its designated share of strategic mobility requirements. The Gulf War provided us the first operational glimpse of CRAF and although successful, there are several problems which, if not corrected, will significantly decrease the effectiveness of CRAF in a full Stage II or Stage III effort.

To begin, the basic structure of CRAF, the stage system, is flawed by improper aircraft allocations. The misallocation inhibits both the operational commander's as well as TRANSCOM's ability to use civil aircraft effectively and efficiently. The first two stages of CRAF need to be larger to provide greater incremental capability to existing organic forces. Also, specific aircraft categories such as aeromedical and cargo are misplaced and should be repositioned in earlier stages.

In addition to structural problems, the CRAF logistical system needs to be redesigned. The current system is decentralized among several carriers with no common planning and virtually no flexibility to fill the voids of uncovered regions. Even if we could predict the geographic location of the next conflict in today's unpredictable world , there is no guarantee the host nation will politically support

the crisis. There is also serious doubt whether a sole civil carrier can meet the needs of over 400 CRAF aircraft composed of several types and manufactures. CRAF logistics support must be centrally organized to increase the capability for decentralized execution.

Next, CRAF management needs to emphasize the planning for integration of civil aircraft into the turmoil of a saturated airlift system. During Desert Shield, MAC was not prepared to manage CRAF aircraft and consequently planned the CRAF support ad hoc. The resulting inefficiencies we experienced will only be the tip of the iceberg if a complete Stage II or Stage III activation occurs.

Finally, the CRAF force needs to obtain basic military equipment for chemical protection and military IFF capability. A viable strategic mobility capability demands our CRAF forces to fly into or near a combat designated area. The chances of fratricide due to lack of identification equipment and the vulnerability to chemical attack is higher for CRAF than the military airlift force.

RECOMMENDATIONS

In light of the aforementioned issues the following recommendations are provided to improve the efficiency and flexibility of today's CRAF force.

LOGISTICS

MAC should augment the current senior lodger concept with a more centrally controlled and managed CRAF airlift support team. This support team could include a nucleus of support personnel readily able to deploy to any crisis in the world.

MAC could model the program after their Airlift Control Elements used for military airlift deployments.

In conjunction with the support teams, MAC should build deployable CRAF equipment packages. These packages would include ground handling equipment, maintenance equipment, and aeromedical support equipment. These equipment packages should be located at a large civil airport for use and upkeep by the civil airlines during peacetime.

Finally, MAC should operationally test the new CRAF support system. This test will determine the viability of the support teams and support packages to deploy on short notice.

STAGE ALLOCATION

MAC should increase the size of both CRAF Stage I and Stage II to generate a greater airlift capability during activation of these stages. (Reference Table 2 for the proposed composition.)

Specifically, emphasize cargo aircraft in earlier stages to match the findings of the Mobility Study as well as our experience in the Desert Shield mobilization. Additionally, MAC needs to shift a greater portion of the cargo-to-passenger convertible aircraft, narrow body aircraft, and aeromedical aircraft to the earlier stages.

Finally, since the CRAF incentive program is the basis for enticing volunteers into different stages, the proposed changes necessitate a change. The new incentive system should reward participation favoring the targeted structure of CRAF.

TABLE 2
PROPOSED COMPOSITION OF CRAF PROGRAM
(# of aircraft)

Segment	Stage I	Stage II	Stage III
Long-range international (PAX)	22	70	256
Long-range international (Cargo)	33	90	150
Short-range international	--	23	33
Domestic	--	35	35
Alaskan	--	3	8
Aeromedical	--	16	33
Total	55	242	515

Proposed changes underlined. Note: Stage II & III figures are cumulative of previous stages.

CRAF MANAGEMENT

Increased MAC emphasis and theater commander involvement in CRAF contingency planning and management will also improve the efficiency of CRAF forces. Initiatives such as training, relaxed CRAF response times, and foreign involvement will help reduce the effects of diminishing returns as the airlift system becomes saturated in a contingency.

First, MAC should increase training for CRAF activations through the use of planning exercises using a Stage III CRAF activation problem. In addition, MAC should approach the civil carriers to see if they would participate in a major exercise with limited notification. This exercise should not only test the planners but also the ability of CRAF to efficiently move cargo to austere locations.

In conjunction with exercises, MAC should solicit civil airlift planners to participate with military planners to foster a closer working relationship during actual activations. This information exchange will allow both the civilian and

military planners to gain expertise on CRAF planning as well as each other's automation and scheduling systems.

Next, the current CRAF response times are unrealistically short for the level of conflict demanding a Stage I or Stage II activation. Additional planning time will increase both military and civilian efficiency of assets as well as minimizing disruption of civilian schedules. Increase CRAF Stage I activation response to 72 hours and Stage II activation response to 48 hours.

One final management initiative is to encourage greater involvement of the theater commanders in CRAF contingency planning. These commanders should identify theater unique limitations in infrastructure as well as expected CRAF airlift needs. Once specific needs and weaknesses are identified, the theater commander should solicit allied support agreements. These pre-agreements will accelerate allied cooperation during contingencies to meet the special circumstances of the region.

EQUIPMENT

To solve the equipment problems of CRAF, MAC should purchase military IFF equipment and chemical equipment for the international CRAF force. This equipment should be stored at a central location for ease of maintainability as well as distribution to forward bases along with the support teams.

In addition, to insure effective use of this equipment, MAC should provide chemical equipment training and war time safe passage training to a cadre of CRAF instructors. CRAF carriers can then provide training to their own volunteer pilots.

In summary, CRAF assets in the Persian Gulf region experienced almost perfect conditions: less than total mobilization; modern and capable airports; unchallenged lines of communication; unlimited fuel and supplies; and a response time of six months--next time we may not have these luxuries. Although the proposed recommendations will solve many of the operational CRAF issues, ultimately the theater commander is the final critic to insure vital CRAF assets have the best chance for success in their area of responsibility. Identification of theater unique limitations as well as operational concerns to TRANSCOM will improve CRAF's ability to fully respond to the airlift requirements of the next war.

APPENDIX I

Available CRAF assets are tracked on a quarterly basis by the DoD through MAC Form 312 listing each vehicle according to carrier, type of aircraft and mission, and aircraft tail number. Current CRAF inventory and capability figures used in this document were taken from the quarterly Civil Reserve Air Fleet (CRAF) Capability Summary for October 1, 1991, shown on the next page. The number of aircraft committed to the CRAF are listed in the summary sheet according to aircraft and mission type, activation stage, and owner. CRAF mission categories are referred to as "segments".

CIVIL RESERVE AIR FLEET (CRAF) CAPABILITY SUMMARY

SOURCE: HQ MAC/XOV

AS OF: 1 October 1991

DOMESTIC SEGMENT

AIRLINE AND CRAF STAGE	Evergreen (EIA)		So Air Trans (SJM)				Express One (FHM)		Kitty Hawk (KHA)				TOTAL	
	L	Q	L	Q			L	Q	L	Q				
AIRCRAFT TYPE	a	m	a	m	a	m	a	m	a	m	a	m	a	m
B727-200C/F	(1)	(1)					(5)	(6)					12	12
B737-200C/F														
DC9-33F	(5)	(5)											5	5
DHC7-103														
CV580/640									(3)	(2)			2	2
L100 (L382)			10	10	6	6							16	16
B737-100/200														
B757-200														
TOTALS	12	12		10	10	6	5	5		2	2		35	35

ALASKAN SEGMENT

AIRLINE AND CRAF STAGE	Northern Air Cargo (RAC)		Reeve Aleutian (RVV)		Markair (MRK)		TOTAL	
AIRCRAFT TYPE	a	m	a	m	a	m	a	m
B727-200C/F					(1)	(1)	1	1
DC9-33F	2	2					2	2
DHC7-103					1	1	1	1
CV580/640			2	2			2	2
L100 (L382)					(2)	(2)	2	2
B737-100/200								
B757-200								
TOTALS	2	2	2	2	4	4	8	8

SHORT-RANGE INTERNATIONAL SEGMENT

AIRLINE AND CRAF STAGE	Aloha Airlines (AAH)		American Trans Air (AMT)		Markair (MRK)		Express One (FHM)		Key Airlines (KEY) JV-1		American Airlines (AAL) JV-1		Sun Country (SCE)		TOTAL	
AIRCRAFT TYPE	a	m	a	m	a	m	a	m	a	m	a	m	a	m	a	m
B727-200C/F								(2)								2
DC9-33F	4				1											5
DHC7-103																
CV580/640																
L100 (L382)																
B737-100/200																
B757-200			4	4			2	4	4	4	13	13		(1)	23	24
TOTALS	4	4	4	4	1	1	2	6	4	4	13	13	1	1	23	33

AEROMEDICAL SEGMENT (STAGE III ONLY)

AIRLINE	American Airlines (AAL)	Trans World (TWA)	Continental (COA)
AIRCRAFT TYPE			
MD-82			3
B767-200	17	9	
AIRLINE TOTALS	17	9	3

AIRLINE	USAIR (USA)
AIRCRAFT TYPE	
MD-81	2
B767-200	2
AIRLINE TOTALS	4

AIRCRAFT TOTALS	
AIRCRAFT TYPE	TOTALS
MD-81	2
MD-82	3
B767-200	28

LONG RANGE AEROMEDICAL CAPABILITY (MPM) = 9.17

DOMESTIC AEROMEDICAL CAPABILITY (MPM) = 1.66

LONG-RANGE INTERNATIONAL SEGMENT

AIRLINE AND CRAF STAGE	America West (AWE)			Continental (COA)			Delta Airlines (DAL)			Rich Int'l (RIA)			Hawaiian (HAL)			Trans World (TWA)			United (UAL)			Fed Express (FDX) JV-1			Northwest (NWA) JV-1			Pan Am (PAA) JV-1			Tower Air (TOW) JV-1			American (AAL) JV-2		
AIRCRAFT TYPE																																			
DC-8													2			1			(2)																
A310-200/300																																			
B747-SP																			4	11								43							
B747-100/200/400			(1)	2	2	8													5	18															
DC10-10					1	7										2	5	15	4	9	24			1	1	9	32	3	(6)	(5)	1	1	4			
DC10-30					3	8														3	6														
DC10-40																																			
L1011-50														5		1	4									5	20								
L1011-100																4	10																		
L1011-500									4																										
TOTALS			3	2	6	23			4			2			12	2	12	29	4	21	39			1	3	14	52	3	6	16	1	1	4	2	8	12

AIRCRAFT TOTALS	
AIRCRAFT TYPE	TOTALS
MD-81	2
MD-82	3
B767-200	28

AIRCRAFT TYPE	Air Trans Int (ATN)			Arrow Air (APW)			Buffalo Airways (BVA)			Florida West (FWL)			So. Air Trans (SJM)			Trans Cont'l (TCH)			Fed Express (FDX) JV-1			Northwest (NWA) JV-1			Pan Am (PAA) JV-1			United Parcel (UPS) JV-1			Emery (EMY) JV-2		
DC8-50/60/70C/F	1	2	4	1	1	4									2			(1)											1	4	13	4	7	22
B707-100C/F										1																								
B747-100F												4	1	1	4																			
B747-100C																				2	(4)								2	-	8			
B747-200F																																		
B747-200C																			4	6	10	2	3	8		(1)	(6)							
DC10-10C/F																											(2)							
DC10-30C/F																					1													
TOTALS	1	2	4	1	1	4				1		4	1	1	6			1	2	5	16													

AIRLINE AND CRAF STAGE	Evergreen (EIA) JV-2						World Airways (WOA) JV-2			American Trans Air (AMT) JV-2																								
AIRCRAFT TYPE																																		
DC8																																		
A310-200/300																																		
B747-SP																																		
B747-100/200/400		1	(1)																															
DC10-10							1	(2)																										
DC10-30																																		
DC10-40																																		
L1011-50										1	3	10																						
L1011-100																																		
L1011-500																																		
TOTALS		1	1				1	2		1	3	10																						

AIRCRAFT TYPE	Evergreen (EIA) JV-2			Flagship Exp (FSX) JV-2			World Airways (WOA) JV-2			American Int'l (CKS) JV-2		
DC8-50/60/70C/F	1	2	3			(1)				1	2	8
B707-100C/F												
B747-100F			(4)									
B747-100C			(4)									
B747-200F												
B747-200C	1	1	(1)									
DC10-10C/F							1	1	4			
DC10-30C/F												
TOTALS	2	3	14			1	1	1	4	1	2	8

CONFIGURATION	TOTAL EACH STAGE		
	I	II	III
FH			11
FV			23
FV	1	6	12
FV	15	33	107
FV		7	27
FV	1	12	32
FV		5	20
FV	1	6	19
FV		4	10
FV			4
	18	73	256

CONFIGURATION	TOTAL EACH STAGE		
C/FH	9	18	47
C/FH	1	1	11
FV	2	5	14
CV		1	14
FV	8	7	18
CV	1	1	3
C/FV			1
C/FV	4	8	23
	23	41	150

GRAND TOTAL: 41 | 114 | 406

CAPABILITY

TYPE	STAGES I	STAGES II
DOMESTIC CARGO CAPABILITY (MTM)	1.62	1.62
ALASKAN CARGO CAPABILITY (MTM)	.34	.34
SHORT RANGE INTERNATIONAL CARGO CAPABILITY (MTM)	.00	.25
SHORT RANGE INTERNATIONAL PASSENGER CAPABILITY (MPM)	5.15	5.80

LONG-RANGE	STAGES I	STAGES II	STAGES III
TOTAL PASSENGER AIRCRAFT CAPABILITY (MPM)	13.24	46.99	154.20
B747 LOWER LOBE BULK CARGO CAPABILITY (MTM)	.35	.77	2.69
NARROW BODY CARGO CAPABILITY (MTM)	.81	1.54	5.65
WIDE BODY CARGO CAPABILITY (MTM) — OVERSIZE	1.33	2.03	7.16
WIDE BODY CARGO CAPABILITY (MTM) — COMBINATION	2.22	3.34	12.15
TOTAL LONG RANGE CARGO CAPABILITY (MTM)	3.03	5.10	17.60

SUMMARY OF SEGMENTS	STAGES I	STAGES II	STAGES III
DOMESTIC		33	33
ALASKAN		8	8
SHORT-RANGE INTERNTIONAL		23	33
LONG-RANGE INTERNTIONAL (PAX)	18	73	256
LONG RANGE INTERNATIONAL (CARGO)	23	41	150
AEROMEDICAL			33
TOTAL CRAF	41	100	515

REMARKS

AMERICA WEST - 1 B767-200 released to lessor and removed from Long Range

EVERGREEN - Aircraft was changed IAW new Domestic contract. 2 B747-100, 1 B747-200, 2 B747-100F, 2 B747-100C, and 1 B7[illegible] - 3C added IAW Stage III contract.

EXPRESS ONE - Added 5 B727-100 IAW new Domestic contract, and 2 B727-100F to Short Range IAW Stage III contract

FLAGSHIP EXPRESS - No longer operates Emery aircraft. 3 DC8-71F added to Long Range IAW Stage III contract

PAN AM - 1 B747-100, 4 B747-100C and 2 B747-200C returned to lessor. 2 A310-300 added to IAW Airlift Services Contract

SUN COUNTRY - 1 DC10-40 returned to lessor and removed from Long Range. 1 B727-200 added to Short Range IAW Stage III contract

SOUTHERN AIR - 1 L382 destroyed on the ground in Africa, but was replaced by 1 L382 which was bought from Markair

KITTY HAWK - 1 CV640 and 1 CV640 added IAW new Domestic Contract

TWA - 2 B747-200 returned to lessor and removed from Aeromedical

EMERY WORLD WIDE - A consolidated carrier, now operates own aircraft

MARKAIR - 1 L382 sold and removed from the Alaskan segment

UNITED AIR LINES - 2 DC8-71 sold and removed from Long Range

TRANS CONT'L - 1 DC8-54F added to Long Range IAW Stage III contract.

FEDERAL EXPRESS - 2 B747-100F sold and removed from Long Range

WORLD AIRWAYS - 1 DC10-10 sold and removed from Long Range

ZANTOP INT'L - Was a Domestic carrier, is no longer in CRAF

NOTES Configuration: C-Convertible, F-Freighter, P-Passenger, W-Wide Body, N-Narrow Body

Capability reflected in millions of ton or passenger miles (MTM or MPM) per day

Cargo capability based on combination of bulk and oversize

O Indicates changes since previous capability summary

MAC HQ Form 312, MAY 90

APPENDIX II
SENIOR LODGER REQUIRED SERVICES

1. Transient alert and ramp services to include:
   a. Landing.
   b. Follow-me vehicle.
   c. Towing.
   d. Parking.
   e. Chocking.
   f. Positioning, operating, and depositioning of aircraft ground power units.
   g. Fire guard for engine starts.
   h. Positioning, operating, and depositioning of engine start carts.
   i. Positioning, operating, and depositioning compressor for airing of struts and tires.
   j. Ramp sweeping.
   k. To-plane service of Hydraulic fluid, ADI fluid, and wing de-icing.
   l. Maintenance/refueling stands.
   m. To-plane fuel servicing.
   n. To-plane oxygen services.
   o. Supervisor to expedite concurrent servicing.

2. Terminal and traffic service to include:
   a. Passenger processing
   b. Passenger manifesting and documentation.
   c. Baggage handling.
   d. Boarding stairs.
   e. Customs.
   f. Medical clearance.
   g. Agricultural clearance.
   h. Immigration clearance.
   i. Cargo processing.
   j. Cargo loading, tiedown, and unloading.
   k. Cargo manifesting and planning.
   l. Cargo loading equipment.
   m. Potable water (including equipment and in-plane servicing).
   n. Baggage carts.
   o. Lavatory servicing.
   p. Flight line crew transportation.
   q. Air conditioning and heating units.

3. Fire and crash rescue equipment.

4. Aircraft clearance facilities.

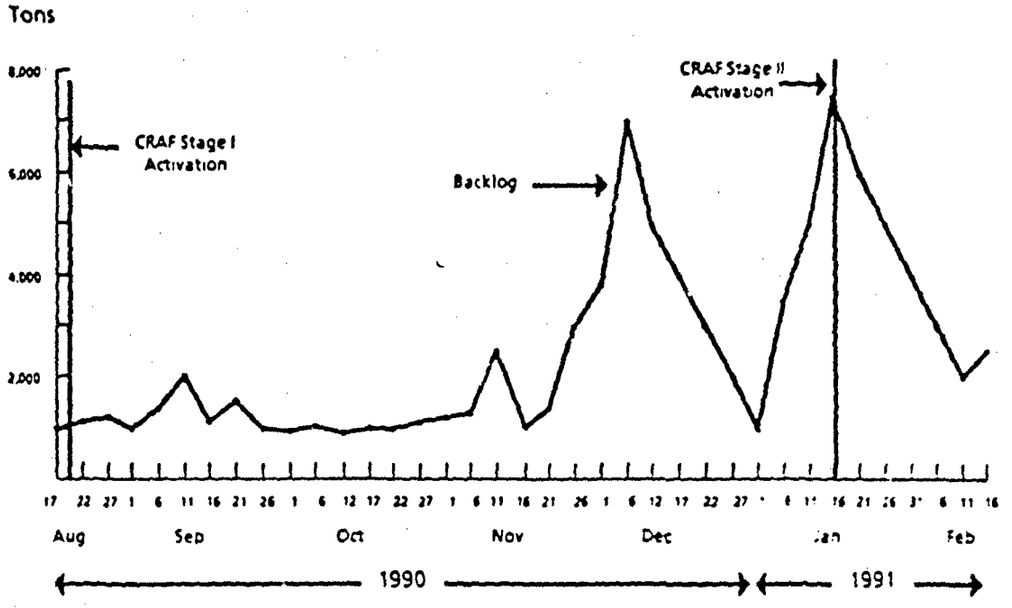
5. Emergency medical services.

6. Aeromedical hub or spoke support.
   a. Interior reconfiguation.
   b. Patient processing and holding facilities.
   c. Therapeutic oxygen servicing coordination.
   d. Anbulance ramp clearance.
   e. Coordination with military medical reception team.

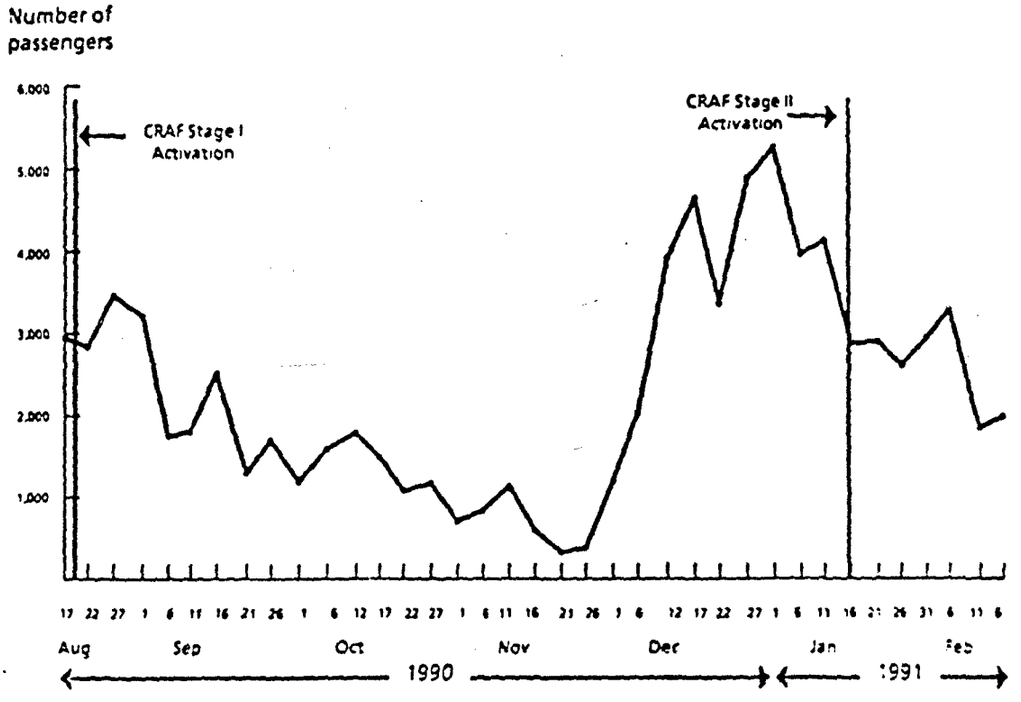
7. Dining and Commissary.
   a. Preparation and procurment of passenger and crew food.
   b. Delivery of food to aircraft.
   c. Galley servicing and supply.

Source: MAC Regulation 55-8, 28 June 1988, pp.18-20.

APPENDIX III

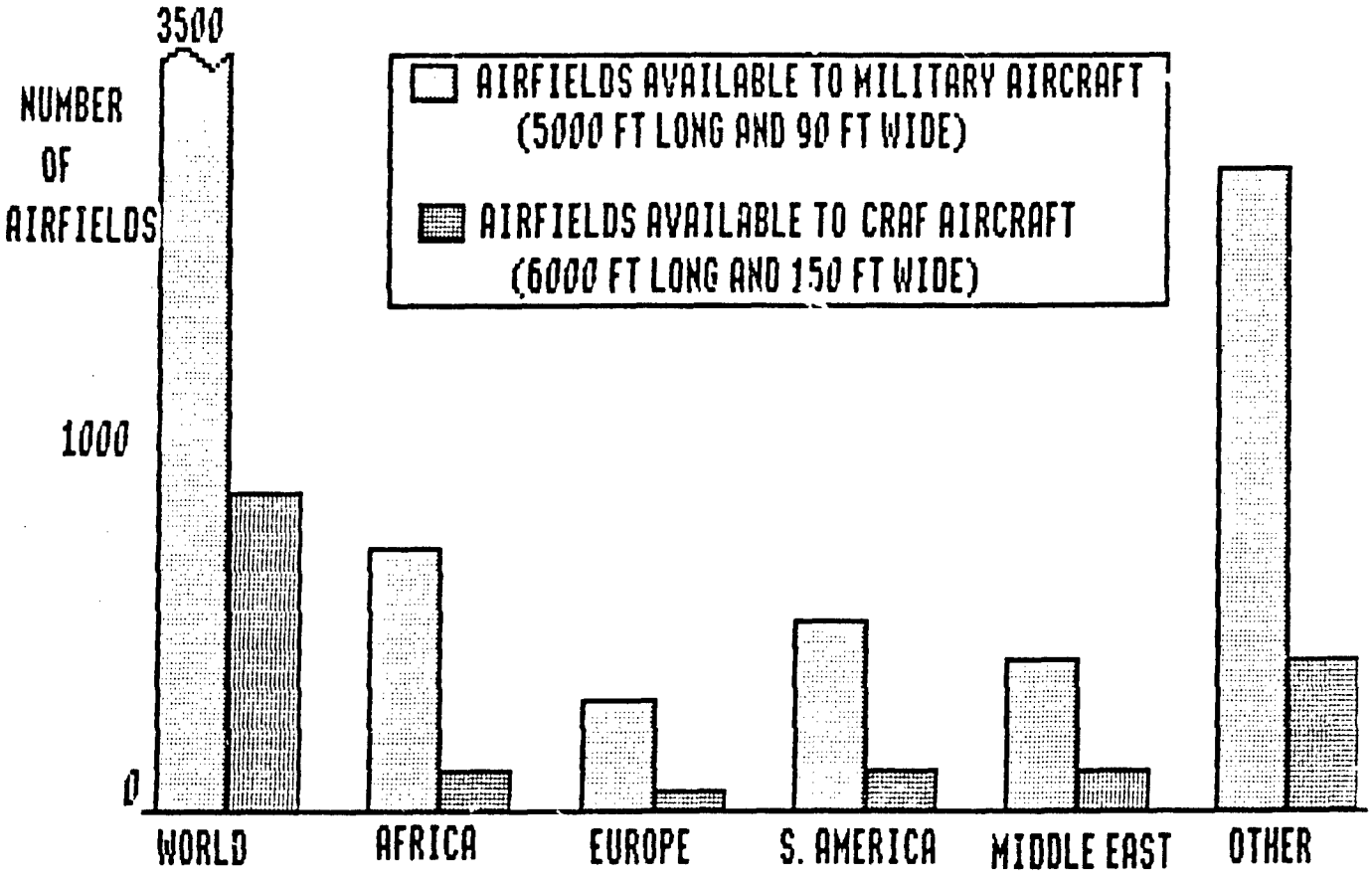


SUSTAINMENT CARGO BACKLOG



PASSENGER MOVEMENTS FOR OPERATION DESERT SHIELD/STORM

APPENDIX IV



NUMBER OF RUNWAYS IN THE FREE WORLD (LESS USA)

Source: Miller, Charles E., Airlift Doctrine, (Maxwell Air Force Base, Alabama: Air University Press, 1988), p. 394.

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2. Robert H. Moore, "A Moving Partnership." Defense 91, March 1991, p. 28.
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